



TIM O'HARE ASSOCIATES

SOIL & LANDSCAPE CONSULTANCY

H Sivyer Transport Ltd
160 Sydenham Road
London
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29th October 2015
Our Ref: TOHA/15/6483/SS
Your Ref: PO 1510/1861

Dear Sirs

Bridgewater Road, QEOP

Imported Soil Analysis – High Permeability Turf Soil

High Permeability Turf Soil - Mixing Trial

We have completed the mixing trial for the preparation of a soil blend to meet the *High Permeability Turf Soil* specification, and have pleasure reporting our findings.

The sample represents a trial mix blended at the office of Tim O'Hare Associates, from sand and green compost components supplied by H Sivyer Transport Ltd. It is understood that the blending is to be replicated at the H Sivyer site, in order to produce a soil that is compliant with the High Permeability Turf Soil specification for the Bridgewater Road project, Queen Elizabeth Olympic Park.

The purpose of the analysis was to determine the sample's compliance with the requirements of *Appendix 6/8-9 High Permeability Turf Soil* of the project specification, *Queen Elizabeth Olympic Park Legacy Transformation – Olympic Park Infrastructure Specification Earthworks Appendix 6* – as listed in the T Loughman & Co Ltd Inspection & Test Plan, (ref: 15/014/12 ITP 01). The results for potential contaminants have been assessed against the Atkins *Site-Specific Assessment Criteria (SSACs) – Human Health Separation Layer for Zone PDZ8/CZ8c, Allotments*.

ANALYTICAL SCHEDULE

The sample was submitted to the laboratory for a range of physical and chemical analyses in accordance with the requirements of the specification. The following parameters were determined:

- Visual examination to record Munsell colour, moisture status, aerobic state, the presence of any deleterious materials, unusual odours (e.g. petroleum hydrocarbons);
- detailed particle size analysis;
- stone content (>2mm, >20mm, >50mm);
- permeability and porosity;
- pH value;
- electrical conductivity values (water and CaSO₄ extracts);
- exchangeable sodium percentage;
- organic matter content;

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- total nitrogen;
- carbon:nitrogen ratio;
- extractable phosphorus, potassium and magnesium;
- phytotoxic contaminants (Cu, Ni, Zn);
- water-soluble boron, water soluble sulphate and total sulphate;;
- limiting values for harm to human health (ref: SSACs);

The results of this process are presented on the attached Certificate of Analysis, and a summary of our findings is provided below.

RESULTS OF ANALYSIS

We have cross-referenced the results against *Appendix 6/8-9 High Permeability Turf Soil* and the *Site-Specific Assessment Criteria (SSACs) for Zone PDZ8/CZ8c*.

Visual Examination

The sample was described as a dark yellowish brown (Munsell Colour 10YR 4/6), slightly moist, friable SAND with a single grain. The sample was virtually stone-free and contained occasional organic fines. No unusual odours, deleterious materials, roots or rhizomes of pernicious weeds were observed.

Horticultural Parameters

The sample was largely compliant with the requirements of *Appendix 6/8-9 High Permeability Turf Soil*, with the exception of the following non-compliances:

Parameter	Result	Specified Requirement
Particles between 0.50 -0.25 mm	47%	50 – 65%
Particles between 2.00 - 1.00 mm	14%	<5%
Particles above 2.00 mm	3% (dry weight)	none
Permeability	109 mm/hr	150 – 300 mm/hr
Total Nitrogen	0.09%	>0.10%

These non-compliances are only considered minor when reviewed in the context of all the other results and considering the proposed end-use of this soil. They should not adversely affect the overall quality and function of the soil for the proposed end-use. The low nitrogen content should be addressed by a routine pre-seeding fertiliser application (e.g. *Everris Sportsmaster Pre-seeder* at a rate of 35 g/m²).

Although the electrical conductivity value by CaSO₄ extract exceeded the maximum specified value (2800 µS/cm), further testing found the sample to possessed a low Exchangeable Sodium Percentage (ESP) value, indicating a low sodium risk.

Chemical Parameters – SSACs

Of the potential contaminants determined so far, none was recorded at levels that exceeded its respective specified maximum permissible value.

The results for **Dioxin (2,3,7,8-tcdd)** will be issued shortly.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if we can be of further assistance.

Yours sincerely

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Soil Scientist*

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Principal Consultant*

For & on behalf of Tim O'Hare Associates LLP

